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आयताकार एल्यूमीनियम बॉक्स —  
विशिष्टि  
( पहला पुनरीक्षण )

Rectangular Aluminium Box —  
Specification  
( First Revision )

ICS 55.120

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## FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Utensils, Cutlery Domestic Hardware Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1975 and reprinted in 1983. In this revision, the following major changes have been incorporated:

- a) Material grades have been revised;
- b) Test for handle has been modified;
- c) Rolling test has been added;
- d) Performance test for hasp has been added; and
- e) Marking clause has been modified.

While laying down this standard due weightage has been given to the proper type of materials to be used and prevalent trade practices being followed by the manufacturers in this field. Though the users are free to have the sizes and dimensions of their choice, the more popular sizes have been given for their guidance.

The relevant SI units and corresponding conversion factors are given below for guidance:

$$\begin{aligned} 1 \text{ kgf/cm}^2 &= 98.066 5 \text{ kPa (kilopascal)} = 10 \text{ m of Water column (WC)} \\ &= 0.098 066 5 \text{ MPa (megapascal)} \\ &= 0.980 665 \text{ bar} \\ 1 \text{ Pa} &= 1 \text{ N/m}^2 \end{aligned}$$

The composition of the committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of the test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***RECTANGULAR ALUMINIUM BOX — SPECIFICATION***( First Revision )***1 SCOPE**

This standard lays down requirements for rectangular aluminum box for general use.

**2 REFERENCE**

The Indian Standard listed in below contain provisions which, through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below:

<i>IS No.</i>	<i>Title</i>
280 : 2006	Mild steel wire for general engineering purposes ( <i>fourth revision</i> )
617 : 1994	Cast aluminum and its alloys - Ingots and castings for general engineering purposes — Specification ( <i>third revision</i> )

737 : 2008	Wrought aluminum and aluminum alloy sheet and strip for general engineering purposes — Specification ( <i>fourth revision</i> )
739 : 1992	Wrought aluminum and aluminum alloys — Wire for general engineering purposes — Specification ( <i>third revision</i> )
740 : 1977	Specification for wrought aluminum and aluminum alloy rivet stock for general engineering purposes ( <i>second revision</i> )
1868 : 1996	Anodic coatings on aluminum and its alloys — Specification ( <i>third revision</i> )
4905 : 2015	Random sampling and randomization procedures ( <i>first revision</i> )
5523 : 1983	Methods of testing anodic coatings on aluminium and its alloys ( <i>first revision</i> )

**3 MATERIAL**

**3.1** The various components of the aluminum box shall be made from the materials as given in Table 1.

**Table 1 Material for Aluminum Box**  
(Clause 3.1)

SI No.	Component	Material	Conforming to
(1)	(2)	(3)	(4)
i)	Body and lid	Aluminum and aluminum alloy sheet of thickness prescribed in Table 1	Designation 19500, 19000, 31000, 52000, 64 430 or 65 032 of IS 737
ii)	Hinges	Aluminum or aluminum alloy sheet of thickness minimum 0.90 mm for box size up to 355 mm and minimum 1.60 mm for larger box sizes.	Designation 19000 or 31000 of IS 737
iii)	Hinge pins	Galvanized mild steel wire or Aluminum or aluminum alloy wire having diameter minimum 1.25 mm for box sizes up to 255 mm and minimum 1.60 mm for larger box size	IS 280  Designation 19000 or 53000 of IS 739
iv)	Hasps and staples	Aluminum and aluminum alloy sheet of thickness minimum 0.90 mm for box sizes up to 355 mm and minimum 1.60 mm for larger box sizes. or Cast aluminum alloy (only for staple)	Designation 19000 or 31000 of IS 737  IS 617
v)	Wire for hasps and staple	Aluminum or aluminum alloy wire of diameter minimum 2.80 mm for box sizes up to 175 mm, minimum 3.55 mm for box sizes 200 mm to 355 mm and minimum 4.50 for larger box sizes.	Designation 19000 or 53000 of IS 739
vi)	Rivets	Aluminum or aluminum alloy wire	Designation 19000 or 53000 of IS 740
vii)	Handle	Aluminum or aluminum alloy wire of diameter minimum 5.00 mm or Cast aluminium alloy	Designation 19000 or 53000 of IS 739  IS 617

#### 4 SIZE AND SHEET THICKNESS

**4.1** The nominal sizes of the aluminum box and the thickness of the aluminum sheet used for a particular size shall be according to Table 2.

**4.1.1** The aluminum boxes may have sizes and sheet thickness other those given in a Table 2 subject to the agreement between the purchaser and the manufacturer.

**Table 2 Nominal Size and Sheet Thickness of Aluminum Box**  
(Clauses 4.1 and 4.1.1)

All dimensions in millimeter

Sl No.	Nominal Size (length)	Sheet Thickness			
		Aluminum and Non Heat Treatable Aluminum Alloys			Heat Treatable Aluminum Alloys of Designation 64430 And 65032 of IS 737
		Designation 19500 of IS 737	Designations 19000 and 3100 of IS 737	Designation 52000 of IS 737	
(1)	(2)	(3)	(4)	(5)	(6)
i)	175 (7")	0.90	0.90	0.71	—
ii)	200 (8")	0.90	0.90	0.71	—
iii)	228 (9")	0.90	0.90	0.71	—
iv)	255 (10")	0.90	0.90	0.71	—
v)	310 (12")	—	1.25	0.90	0.90
vi)	332 (13")	—	1.25	0.90	0.90
vii)	322 (14")	—	1.25	0.90	0.90
viii)	406 (16")	—	1.25	0.90	0.90
ix)	457 (18")	—	1.25	0.90	0.90
x)	505 (20")	—	1.25	0.90	0.90
xi)	555 (22")	—	1.60	1.25	1.25
xii)	610 (24")	—	1.60	1.25	1.25

NOTE — Since the sizes of aluminum box are still popularly known in the industry in inches, the inch equivalents for the sizes have also been given in parentheses in column 1 for convenience of the manufactures and the user.

## 5 MANUFACTURE

**5.1** The pressed aluminum boxes shall have a minimum length to width ratio of one. The depth of the drawn body (without lid) shall be minimum 10 percent of the width of the box in the case of shallow boxes, 40 percent of the width for general run boxes and maximum 200 percent of the width in the case of deep boxes.

**5.2** The maximum permissible reduction in thickness in the pressed aluminum boxes shall not exceed 10 percent

of the sheet thickness when measured at the thinnest location.

**5.3** The handle with its lugs and attachment shall be securely attached and it shall be centrally located on the front side of the box. In the case of boxes of size smaller than 174 mm, handle need not be provided. The wire handle in the case of boxes of size up to 225 mm shall be secured in appropriate perforated tabs formed in the parent

sheet. In larger sizes the handle shall be secured by means of lugs riveted to the parent sheet.

**5.4** The smaller boxes (of sizes up to 174 mm) shall be provided with a suitable arrangement, such as nib and bead, or nib and slot, for catching the lid on the body. The boxes of size 175 mm to 400 mm shall be provided with one set of hasp and staple at the centre of the front side of box. The boxes of size larger than 400 mm shall be provided with two sets of hasps and staples, one set located near each end of the front side. The hasps may be of sheet construction only or the combination of sheet and wire.

**5.5** The boxes of size smaller than 355 mm shall be made by pressing whereas the larger sizes may be made as agreed to between the purchaser and the supplier. The boxes of size larger than 310 mm shall be provided with a formed button (round depression) on the bottom at each corner to avoid contact with ground. The lid and the bottom of larger boxes may be of ribbed construction so as to provide additional strength.

**5.6** The handle with its fittings and attachments shall be strong and shall not yield under normal usage. Box shall be provided with two handles on each side and one at middle. They shall be symmetrically located from the vertical edge. The front handle shall be fixed in such a manner that it shall not interfere with the lock while lifting or pulling the trunk. The side handles shall be fixed such that they shall open for not more than 100° in order to avoid pinching of the fingers between handle and side while lifting the loaded box. The clearance between body of box and inner face of handle shall be ample enough to facilitate gripping.

## **6 WORKMANSHIP AND FINISH**

**6.1** The aluminum box shall be finished smooth and shall be free from sharp edges, burrs, dents, puckers, scratches, deep tool marks and other surface defects. It shall be sufficiently strong and rigid so as not to buckle or yield under normal usage.

**6.2** The hinges, handle, hasps, and staple shall be neatly formed and fitted to the box in a good workman like manner. The tabs, nibs, slots, beads and button formed shall be of regular shape and placed symmetrically in required location.

**6.3** The outer surface of the box shall finished bright by buff polishing and the inside surface shall be frosted by caustic dip.

**6.4** The box may be anodized if agreed to between the purchaser and the supplier. The anodizing shall conform to Grade AC 10 of IS 1868.

## **7 TESTS**

### **7.1 Test for Handle**

All the handles shall be tested to withstand a total load of three times the internal volume of the box (in litres of water) for minimum of 30 minutes. There shall be no damage to the handle.

### **7.2 Test for Soundness of Joints**

The box shall be dropped from a height of 150 cm, once on the largest flat surface, once on the longest edge and once on any corner. The joints shall not be opened after the test.

### **7.3 Test for Anodizing**

The anodized aluminium box shall satisfy the relevant tests given in IS 5523.

### **7.4 Rolling Test for Box**

The box shall be subjected to rolling on its sides either 6 m forward and 6 m backward or 12 m in one direction only. The box shall not be damaged after the test.

### **7.5 Load Test for Hasps**

**7.5.1** Apply vertical load of 1 kg to the hasp for minimum of 30 minutes. There shall be no damage to the hasp.

**7.5.2** Apply horizontal load of 1 kg on either side (one at a time) to the hasp for minimum of 5 minutes. There shall be no damage to the hasp.

### **7.6 Hinge Performance Test**

Open and close the lid of the trunk for 1 000 times. There shall be no damage to the hinge.

Note – Opening shall be minimum 90°.

## **8 SAMPLING**

**8.1** Sampling procedure and acceptance criteria for the aluminum boxes shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Annex A.

## 9 MARKING

**9.1** Each box shall be legibly stamped on the vertical side with the manufacturer's name, recognized trade-mark, material grade and year of manufacture.

**9.1.1** The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standard Act, 2016* and the Rules and Regulation

framed there under, and the product(s) may be marked with the Standard Mark.

## 10 PACKING

**10.1** Each trunk shall be suitable packaged to avoid any damage during transit. The packaging shall be eco-friendly.

### Annex A

(Clause 7.1)

#### SAMPLING PROCEDURE AND CRITERIA FOR CONFORMITY FOR ALUMINIUM BOXES

### A-1 SAMPLING

#### A-1.1 Lot

In any consignment all the boxes of the same size manufactured from the same material under essentially similar condition of manufacture shall be grouped together to constitute a lot.

**A-1.1.1** For ascertaining the conformity of a lot to the requirements of this standard, the sample of the boxes shall be selected and tested separately for each lot.

**A-1.2** The number of boxes to be selected at random from a lot shall depend upon the size of the lot and shall be in accordance with column 1 and 2 of Table 3.

**Table 3 Sample Size and Criteria for Conformity**

(Clauses A-1.2, A-1.3.1 and A-1.3.2)

Sl No.	Lot Size (No. of Boxes in the Lot)	For Dimension, Materials and Workmanship		Tests at 7	
		Sample Size	Permissible No. of Defectives	Sub-sample Size	Permissible Number of Defectives
(1)	(2)	(3)	(4)	(5)	(6)
i)	Up to 100	8	0	3	0
ii)	101 to 150	13	1	3	0
iii)	151 to 300	20	2	5	0
iv)	301 to 500	32	3	8	0
v)	501 to 1 000	50	5	13	1
vi)	1 001 to 3 000	80	7	20	2
vii)	3 001 to 10 000	125	10	32	3

**A 1.2.1** The boxes in the sample shall be selected at random from the lot and In order to ensure the randomness of selection, procedures laid down in IS 4905 may be followed.

#### A-1.3 Number of Tests and Criteria for Conformity

The lot having found conforming under **A-1.3.1** shall be inspected for tests at 7. For this purpose, a number of

boxes in accordance with column 4 of Table 3 shall be selected at random from those inspected and found conforming under **A-1.3.1** and subjected to these tests. The lot shall be considering as conforming to the requirements of these tests if the number of boxes failing in any one or more of these tests does not exceed the permissible number given in column 5 of Table 3.

## ANNEX B

(Foreword)

## COMMITTEE COMPOSITION

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